

REMARKS

I. Drawing Figure Changes

Figure 3 was objected to because it showed the prior art circuit arrangement but was not labeled "Prior Art".

Changes were made in Fig. 3 to overcome this objection and to label an empty box in accordance with the rule for drawings for better understanding. Also a box in Fig. 2 was labeled for improved understanding.

Replacement Figs. 2 and 3 were prepared to make these changes and accompany this amendment.

Approval of the changes in Figs. 2 and 3 and withdrawal of the objection to Fig. 3 is respectfully requested.

II. Indefiniteness Rejection

Claims 9 to 16 were rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.

Claims 9 to 16 have been canceled, obviating their rejection.

New claims 17 to 21 have been drafted to claim a circuit arrangement for generating square pulses for use in connection with a magnetic field probe, i.e. an inductive resistor. These claims are broader than new claims 22 to 26 for the compensation current sensor, which includes the circuit arrangement.

The claim wording of claims 9 to 16 was objected to because it was not clear what the claimed elements were and how they were interconnected to

produce the desired result. The original claims, on which these claims were based, were translated from a foreign language and were not drafted in accordance with U.S. Patent Office Rules for apparatus claims.

New Independent claim 17 recites the components included in the claimed circuit arrangement one after the other in logical fashion. All but two components shown in figure 1 for the preferred embodiment of the circuit arrangement are recited in new independent claim 17. The two omitted components from claim 17 are recited in claim 22 and 23.

Applicants are not required to recite all components or parts of a preferred embodiment of the claimed circuit arrangement in the main independent claim, only those parts or components that are essential to properly describe and distinguish the claimed invention from the prior art (M.P.E.P. 2172.01).

Furthermore if parts of the invention that have not been included in the main Independent claim and are considered critical or essential and rejection is based on that, they must be identified in the Office Action. It is a requirement for rejections based on a lack of an essential part of the claim that that missing essential part should be identified in the Office Action (M.P.E.P. 2164.06). No such identification was made in the Office Action.

Nevertheless the circuit arrangement has been limited to a circuit arrangement in which the energy-storing element 3 is a magnetic sensor probe consisting of an inductive resistor. For this reason the new claim 17 includes feature and limitations from canceled claims 9 to 12.

In addition, new claims 22 to 26 have been filed for the correspondingly

improved compensation current sensor having less sensitivity to component tolerances, as described on page 3 of the U.S. specification. This current compensation sensor includes the core 13 with the coil 14 wound around it as shown in Fig. 2. Basis for these claims is found in the originally filed canceled claims 1 to 4, especially claims 3 and 4, and also on page 9 and Fig. 2.

With respect to interconnections of the components interconnections between components of the circuit arrangement are included in new independent claims 17 and 22. These interconnections are described in the detailed description and shown in Fig. 1. Furthermore almost all connections and components shown in Fig. 1 are set forth in claims 17 to 21.

As far as "how they are interrelated to produce the desired result". There is no requirement in the rules to include functional language (if there is please cite the rule), although it is often desirable. Nevertheless some functional language is included in the last paragraph of claim 17. The statute states that the structure of the inventive circuit arrangement must be particularly pointed out and distinctly claimed. This means that one must at least recite the essential parts or components and the essential manner in which they are interconnected. Particularly specific and definite differences between the circuit arrangement of the invention and the prior art must be included.

For the foregoing reason and because of the changes in the claim wording it is respectfully submitted that none of the new claims 17 to 26 should be rejected under 35 U.S.C. 112, second paragraph.

III. Specification

The reference to the claims in the paragraph at page 3, lines 24 to 26, was objected to on the grounds that it is improper to include subject matter in the specification by reference to the claims.

This paragraph has been replaced by a new paragraph, which adds to the objects of the invention. The objects of the invention also include a compensation current sensor shown in Fig. 2 and now claimed in claims 22 to 26. The new or replacement paragraph does not make any reference to claims by number or otherwise.

A few other changes were also made in the specification to correct minor grammatical errors and to provide a text in better idiomatic English.

For the foregoing reasons and because of the above changes in the specification withdrawal of the objection to the specification on page 2 of the Office Action is respectfully requested.

IV. Abstract and Title

The abstract was objected to on page 2 of the Office Action.

The above changes replace the abstract with a new abstract that complies with U.S. Patent Office Rules. The new abstract has less than 150 words and is in a single paragraph. The new abstract includes the subject matter of the original abstract in more abbreviated form without figure reference numbers. Also the new abstract includes a reference to the compensation current sensor.

The title has also been expanded to include the compensation current

sensor, which is now being claimed in claims 22 to 26. This provides a title, which is descriptive of the invention as it is now being claimed.

Withdrawal of the objection to the abstract on page 2 of the Office Action and approval of the amended title are respectfully requested.

V. Anticipation Rejection

Claims 9 to 14 and 16 were rejected as anticipated under 35 U.S.C. 102 (e) based on Mizumoto, et al.

Claims 9 to 14 and 16 have been canceled, obviating this anticipation rejection.

New claims 17 to 21 have been filed and replace claims 9 to 16.

Mizumoto, et al, concerns the braking of a brushless electric motor and the associated control circuit for that purpose, which produces a suitable square wave signal and supplies it to the motor. The circuit arrangement does include a flip-flop 12, a comparator 11, a bridge circuit 4U, 4V, 5U, 5V and a coil 6 connected across the bridge, which does have an inductance. However this coil 6 is simply a two-phase winding of the motor (column 2, lines 2 to 10).

Furthermore the Mizumoto, et al, embodiment shown in Fig. 1 only discloses an RS flip-flop 12, which requires an oscillator 13 connected to the R input in order to switch the flip-flop. An oscillating clock in oscillator 13 periodically resets the flip-flop (column 4, lines 45 to 50). In contrast, applicants' claimed circuit and prior art circuit includes an edge-triggered flip-flop 1,21, which operates in an entirely different manner, cooperating with the coil 3,25,

which operates as an energy-storing device. This cooperation is explained in some detail in the two paragraphs on page 2, line 8, to page 3, line 10, of applicants' specification. Basically energy-storing element, namely coil 3, is alternately charged as a function of switching state of the edge-triggered flip-flop.

The difference between the edge-triggered flip-flop and the RS flip-flop is enough of itself to avoid anticipation of the claimed invention of claim 17 by this reference. In addition, the reference does not teach that coil 6 is alternately charged as a function of switching state of the flip-flop. This difference is clearly present in the independent claims. Furthermore it is advantageous that an oscillator is unnecessary for proper functioning of the flip-flop in applicants' circuit arrangement.

In addition, the four switches in the circuit in the reference must be connected up in a special manner in order to brake the motor, as explained regarding the control circuit in the last several paragraphs of the reference. Also see the explanation in column 5, lines 4 to 15. Currents must be sent through the coils in a carefully timed manner in order to oppose the motions of the motor during braking to slow its rotation.

The switching of the transistor switches of the bridge according to claim 17 differs from that of the reference. The last paragraph of claim 17 states that

" pairs (7,10 or 8; 9) of said switches on opposite sides of the transverse branch are connected by said flip-flop (1) in crossover fashion, so that said current flowing in said energy-storing element (3) is reversible".

This is the functional reason for the connection of the inverters 5,6 with the switches and the flip-flop outputs as shown in applicants' figure 1. Thus the last paragraph of claim 17 includes features regarding the connection of the switches with the flip-flop via the inverters using functional language. The term "in crossover fashion" is not indefinite because it is defined in the specification on page on page 7 of the U.S. specification.

Note that this manner of connecting the switches in applicants' circuit arrangement is always "in crossover fashion", irregardless of the state or condition of the device. In contrast during braking the switches of the reference are not always connected in crossover fashion. That is because the input V_{ref} to the comparator 11 is changed, as explained in column 4, line 14 to 33, of the reference so that switches corresponding to switches 8,9 of applicants in the reference are not both "on". Nevertheless as this paragraph points out the current d does not reverse direction.

Thus applicants' claim 17 claims a different type of switching the four switches or transistors in the bridge than claimed by claim 1 of Mitsumoto, et al. This is hardly surprising since the circuit arrangement of the applicants is designed to improve a controller circuit for a compensation current sensor, which is entirely different from the application of Mitsumoto, et al, namely the bracking of an electric motor.

According to M.P.E.P. 2131 in order to reject a claimed invention as anticipated under 35 U.S.C. 102 each and every element of the claimed invention

must be disclosed in a single prior art reference, either expressly or inherently.

Mizumoto, et al, does not disclose a circuit arrangement with an edge-triggered flip-flop, which differs from the RS flip-flop of Mizumoto, et al, which requires an oscillator. Also Mizumoto, et al, does not disclose the fundamental connections required for switching the MOSFETs or switches as claimed in the last paragraph of claim 17, namely that they switch "in a crossover manner" in operation under control of the flip-flop and the inverters 5,6.

As for claims 22 to 26, these claims claim a compensation current sensor as shown e.g. in Fig. 2 with many other different components than the circuit arrangement of Mizumoto, et al, which is used for an entirely different purpose.

For the foregoing reasons and because of the changes in the claim wording for the main claim, it is respectfully submitted that none of the new claims 17 to 26 should be rejected under 35 U.S.C. 102 (e) as anticipated by Mizumoto, et al.

VI. Obviousness Rejection

Claim 15 was rejected as obvious under 35 U.S.C. 103 (a) over Mizumoto, et al, in view of Mittel, et al.

Claim 15 has been canceled, but the subject matter of claim 15 is now present in claim 20.

The reference Mittel, et al, describes and claims mode tracking transducer drive circuit, in which a square wave signal is produced for a nonlinear transducer 102. The transducer 102 produces a tactile vibration, so that the

device can be used in pagers and/or cellular telephones to signal that a transmission has been received.

A. The References are Not Combinable

One skilled in the electronic circuitry arts would not consult Mittel, et al, for suggestions for modifications and/or improvements in the apparatus of Mizumoto, et al. These references concern completely different subject matter. The Mittel, et al, reference relates to pager and/or cell phone circuitry for signaling reception of a telephone call, while the circuitry of Mizumoto, et al, has to do with braking an electric motor. Thus the circuitry would convey controlling signals to the inputs of the RS flip-flops and the transistor switches in different ways to achieve entirely different results. For that reason one skilled in the art could not find a suggestion in Mittel, et al, to use the MOSFETs used in the circuitry of Mittel, et al, as the switches in the device of Mizumoto, et al, as suggested in the Office Action.

Of course it is well known in the electronic arts to use MOSFETs as electronic switches.

For example, note that the U.S. classification numbers of the two references are entirely different. Thus there is no reason to use the auxiliary devices associated with the bridge in Mittel, et al, together in the device of Mizumoto, et al.

B. The References Would Not Suggest *all* the Subject Matter of Claim 20

Even assuming that the Mittel, et al, and Mizumoto references can be combined under 35 U.S.C. 103 (a), all the combined subject matter of claim 20 and claim 17 is not suggested by the combination of these two references.

The bridge switches of Mittel, et al, and Mizumoto, et al, are connected in entirely different ways from each other and the present invention, because the purpose of the switching in the two references is different and does not relate to similar applications. The MOSFETs of Mittel, et al, are not connected via inverters with the flip-flop outputs, in accordance with the subject matter of claim 20. On the other hand, Mizumoto, et al, does connect two transistor switches of the bridge directly to the outputs of the flip-flop and two indirectly through inverters. However the wording in new claim 20 distinguishes the manner in which the inverters connect the switches and the flip-flop according to the invention from that of Mizumoto, et al. It is important to make these connections so that the circuitry of the claimed invention can function as described in the main independent claims by switching the switches "in a crossover fashion".

Nelther reference suggest the following features of claim 20:

"one of said outputs of said flip-flop (1) is directly connected to a first (10) of said switches and indirectly to a second (7) of said switches via an inverter (5) and another of said outputs of said flip-flop (1) is directly connected to a third (9) of said switches and indirectly connected to a fourth (8) of said switches via another inverter (6) connected to another of said outputs of said flip-flop (1), in order to switch said switches in said crossover fashion."

The connections of the flip-flop with the switches made by Mizumoto, et al, differ from the above-described connections because the apparatus of Mizumoto, et al, is dedicated to a different purpose. In Mizumoto, et al, a single output of the flip-flop is directly connected to two different switches without the intervening inverter. In the case of applicants' invention one output of the flip-flop is directly connected to one switch, while the other output of the flip-flop is directly connected to another switch. This difference is important to provide the different switching functions.

The differences in making the connections between the flip-flop and the switches via inverters are not suggested in Mizumoto, et al, or Mittel, et al.

It is well established by many U. S. Court decisions that to reject a claimed invention under 35 U.S.C. 103 there must be some hint or suggestion in the prior art of the modifications of the disclosure in a prior art reference or references used to reject the claimed invention, which are necessary to arrive at the claimed invention. For example, the Court of Appeals for the Federal Circuit has said:

"Rather, to establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant...Even when obviousness is based on as single reference there must be a showing of a suggestion of motivation to modify the teachings of that reference.." *In re Kotzab*, 55 U.S.P.Q. 2nd 1313 (Fed. Cir. 2000). See also M.P.E.P. 2141

For the foregoing reasons and because of the changes in claim wording, it is respectfully submitted that new claim 20 should not be rejected under 35 U.S.C. 103 (a) as obvious from Mizumoto, et al, in view of Mittel.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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OCT 28 2003